

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

at least one set of complementarily operating first and second switching
5 elements serially interposed between first and second main power supply terminals
supplied with a dc voltage;

at least one control circuit driving/controlling said at least one set of first and
second switching elements; and

a shunt resistor detecting a current flowing across said first and second main
10 power supply terminals, wherein

said at least one control circuit comprises:

at least one current detection circuit detecting a voltage generated by a current
flowing to said shunt resistor and outputting a current abnormality signal indicating
current abnormality when detected said voltage is in excess of a prescribed level, and

15 a fault circuit receiving said current abnormality signal output from said at least
one current detection circuit and outputting a stop signal for stopping operation of at least
one of said first and second switching elements, and

said fault circuit has a function of outputting said stop signal to the exterior of
said at least one control circuit while stopping operation of at least one of said first and
20 second switching elements also by a signal, identical to said stop signal, input from the
exterior of said at least one control circuit.

2. The semiconductor device according to claim 1, wherein

said at least one current detection circuit includes first and second current
25 detection circuits, and

said first current detection circuit is set higher in detection sensitivity than said second current detection circuit.

3. The semiconductor device according to claim 2,
5 comprising a plurality of said control circuits, and
comprising a plurality of sets of said first and second switching elements in
correspondence to said plurality of control circuits respectively, wherein

only one of said plurality of control circuits detects said voltage of said shunt
resistor by said first current detection circuit while remaining said control circuit is
10 electrically connected to said shunt resistor to detect said voltage of said shunt resistor by
said second current detection circuit.

4. The semiconductor device according to claim 1,
comprising a plurality of said control circuits, and
15 comprising a plurality of sets of said first and second switching elements in
correspondence to said plurality of control circuits respectively, wherein

only one of said plurality of control circuits detects said voltage of said shunt
resistor, outputs said stop signal and supplies the same to said fault circuit of remaining
said control circuit.

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5. The semiconductor device according to claim 1, wherein
said at least one control circuit further comprises:

a voltage detection circuit detecting a driving voltage supplied to said at least
one control circuit and outputting a voltage reduction signal indicating voltage reduction

25 when said driving voltage is below a prescribed level, and

said fault circuit outputs said stop signal when at least one of said voltage reduction signal and said current abnormality signal is output.

6. The semiconductor device according to claim 5, wherein

5 said driving voltage is supplied to a control electrode of a low-potential side one of said at least one set of first and second switching elements also as a control voltage.

7. The semiconductor device according to claim 5, wherein

10 said at least one current detection circuit includes first and second current detection circuits, and

 said first current detection circuit is set higher in detection sensitivity than said second current detection circuit.

15 8. The semiconductor device according to claim 7,

 comprising a plurality of said control circuits, and

 comprising a plurality of sets of said first and second switching elements in correspondence to said plurality of control circuits respectively, wherein

20 only one of said plurality of control circuits detects said voltage of said shunt resistor by said first current detection circuit while remaining said control circuit is electrically connected to said shunt resistor to detect said voltage of said shunt resistor by said second current detection circuit.

9. The semiconductor device according to claim 5,

25 comprising a plurality of said control circuits, and

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